

# 300mA Low Dropout Linear Regulator

## FEATURES

- Low Dropout Voltage of 470mV at 300mA Output Current (3.0V Output Version).
- Guaranteed 300mA Output Current.
- Low Ground Current at 55 $\mu$ A.
- 2% Accuracy Output Voltage of 1.8V/ 2.0V /2.5V /2.7V/ 3.0V/ 3.3V/ 3.5V/ 3.7V/ 3.8V/ 5.0V/ 5.2V.
- Only needs 1 $\mu$ F Output Capacitor for Stability.
- Current and Thermal Limiting.

## APPLICATIONS

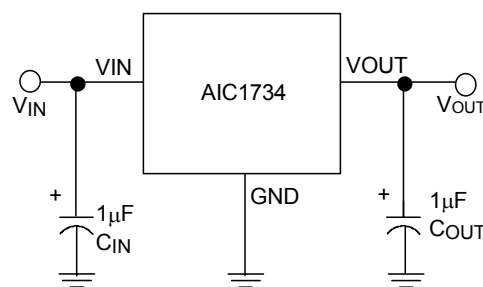
- CD-ROM Drivers.
- LAN Cards.
- Microprocessor.
- RAM Module.
- Wireless Communication Systems.
- Battery Powered Systems.

## DESCRIPTION

The AIC1734 is a 3-pin low dropout linear regulator. The superior characteristics of the AIC1734 include zero base current loss, very low dropout voltage, and 2% accuracy output voltage. Typical ground current remains approximately 55 $\mu$ A, for loading ranging from zero to maximum. Dropout voltage at 300mA output current is exceptionally low. Built-in output current limiting and thermal limiting provide maximal protection to the AIC1734 against fault conditions.

The AIC1734 is available in popular SOT-23, SOT-89 and TO-92 packages.

## TYPICAL APPLICATION CIRCUIT



**Low Dropout Linear Regulator**

## **ORDERING INFORMATION**

AIC1734-XXXXX XX

PACKING TYPE  
TR: TAPE & REEL  
BG: BAG

PACKAGE TYPE  
U: SOT-23  
XA: SOT-89  
XT: SOT-89  
ZT: TO-92  
ZL: TO-92

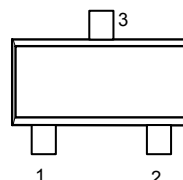
C: Commercial  
P: Lead Free Commercial

OUTPUT VOLTAGE  
18: 1.8V  
20: 2.0V  
25: 2.5V  
27: 2.7V  
30: 3.0V  
33: 3.3V  
35: 3.5V  
37: 3.7V  
38: 3.8V  
50: 5.0V  
52: 5.2V

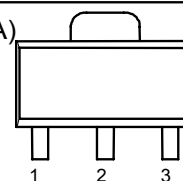
Example: AIC1734-18CXATR  
→ 1.8V Version, in SOT-89 Package &  
Tape & Reel Packing Type  
AIC1734-18PXATR  
→ 1.8V Version, in SOT-89 Lead Free  
Package & Tape & Reel Packing Type

### **PIN CONFIGURATION**

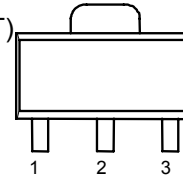
SOT-23 (CU & PU)  
TOP VIEW  
1: GND  
2: VOUT  
3: VIN



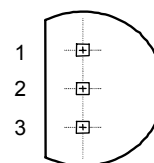
SOT-89 (CXA & PXA)  
TOP VIEW  
1: GND  
2: VIN  
3: VOUT



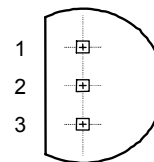
SOT-89 (CXT & PXT)  
TOP VIEW  
1: VOUT  
2: GND  
3: VIN



TO-92 (CZT & PZT)  
TOP VIEW  
1: GND  
2: VIN  
3: VOUT



TO-92 (CZL & PZL)  
TOP VIEW  
1: VIN  
2: GND  
3: VOUT



## **SOT-23 MARKING**

Part No.	CU	PU	Part No.	CU	PU
AIC1734-18XU	CD18	CD18P	AIC1734-35XU	CD35	CD35P
AIC1734-20XU	CD20	CD20P	AIC1734-37XU	CD37	CD37P
AIC1734-25XU	CD25	CD25P	AIC1734-38XU	CD38	CD38P
AIC1734-27XU	CD27	CD27P	AIC1734-50XU	CD50	CD50P
AIC1734-30XU	CD30	CD30P	AIC1734-52XU	CD52	CD52P
AIC1734-33XU	CD33	CD33P			

● **SOT-89 MARKING**

Part No.	CXA	PXA	Part No.	CXT	PXT
AIC1734-18XXA	CA18	CA18P	AIC1734-18XXT	CB18	CB18P
AIC1734-20XXA	CA20	CA20P	AIC1734-20XXT	CB20	CB20P
AIC1734-25XXA	CA25	CA25P	AIC1734-25XXT	CB25	CB25P
AIC1734-27XXA	CA27	CA27P	AIC1734-27XXT	CB27	CB27P
AIC1734-30XXA	CA30	CA30P	AIC1734-30XXT	CB30	CB30P
AIC1734-33XXA	CA33	CA33P	AIC1734-33XXT	CB33	CB33P
AIC1734-35XXA	CA35	CA35P	AIC1734-35XXT	CB35	CB35P
AIC1734-37XXA	CA37	CA37P	AIC1734-37XXT	CB37	CB37P
AIC1734-38XXA	CA38	CA38P	AIC1734-38XXT	CB38	CB38P
AIC1734-50XXA	CA50	CA50P	AIC1734-50XXT	CB50	CB50P
AIC1734-52XXA	CA52	CA52P	AIC1734-52XXT	CB52	CB52P

■ **ABSOLUTE MAXIMUM RATINGS**

Input Supply Voltage.....-0.3 ~12V

Operating Temperature Range.....-40°C~ 85°C

Storage Temperature Range .....-65°C~150°C

Maximum Junction Temperature.....125°C

Lead Temperature (Soldering) 10 sec.....260°C

Thermal Resistance Junction to Ambient SOT-89 Package.....160°C/W

(Assume no Ambient Airflow, no Heatsink) TO-92 Package.....150°C/W

SOT-23 Package.....180°C/W

**Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.**

■ **TEST CIRCUIT**

Refer to the TYPICAL APPLICATION CIRCUIT

**ELECTRICAL CHARACTERISTICS** ( $T_A=25^{\circ}\text{C}$ ,  $C_{IN}=1\mu\text{F}$ ,  $C_{OUT}=1\mu\text{F}$ , unless otherwise specified.)

PARAMETER	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	No Load				
	AIC1734-52 $V_{IN}=5.5\sim 12\text{V}$	5.100	5.200	5.300	
	AIC1734-50 $V_{IN}=5.5\sim 12\text{V}$	4.900	5.000	5.100	
	AIC1734-38 $V_{IN}=4.1\sim 12\text{V}$	3.725	3.800	3.875	
	AIC1734-37 $V_{IN}=4.0\sim 12\text{V}$	3.625	3.700	3.775	
	AIC1734-35 $V_{IN}=4.0\sim 12\text{V}$	3.430	3.500	3.570	
	AIC1734-33 $V_{IN}=4.0\sim 12\text{V}$	3.235	3.300	3.365	V
	AIC1734-30 $V_{IN}=4.0\sim 12\text{V}$	2.940	3.000	3.060	
	AIC1734-27 $V_{IN}=4.0\sim 12\text{V}$	2.646	2.700	2.754	
	AIC1734-25 $V_{IN}=4.0\sim 12\text{V}$	2.450	2.500	2.550	
	AIC1734-20 $V_{IN}=4.0\sim 12\text{V}$	1.960	2.000	2.040	
	AIC1734-18 $V_{IN}=4.0\sim 12\text{V}$	1.764	1.800	1.836	
Output Voltage Temperature Coefficiency	(Note 1)		50		PPM/ $^{\circ}\text{C}$
Line Regulation	$I_L=1\text{mA}$ , $1.4\text{V}\leq V_{OUT}\leq 3.2\text{V}$ $V_{IN}=4\text{V}\sim 12\text{V}$		3	10	mV
	$3.3\text{V}\leq V_{OUT}\leq 5.2\text{V}$ $V_{IN}=5.5\text{V}\sim 12\text{V}$		3	10	
Load Regulation (Note 2)	$I_L=0.1\sim 300\text{mA}$ $1.4\text{V}\leq V_{OUT}\leq 3.9\text{V}$ $V_{IN}=5\text{V}$		7	20	mV
	$4.0\text{V}\leq V_{OUT}\leq 5.2\text{V}$ $V_{IN}=7\text{V}$		15	40	
Current Limit (Note 3)	$V_{IN}=7\text{V}$ , $V_{OUT}=0\text{V}$	300			mA
Dropout Voltage (Note 4)	$I_L=300\text{mA}$ $4.0\text{V}\leq V_{OUT}\leq 5.2\text{V}$		400		
	$3.0\text{V}\leq V_{OUT}\leq 3.9\text{V}$		470		
	$2.5\text{V}\leq V_{OUT}\leq 2.9\text{V}$		570		mV
	$2.0\text{V}\leq V_{OUT}\leq 2.4\text{V}$		800		
	$1.4\text{V}\leq V_{OUT}\leq 1.9\text{V}$		1260		
Ground Current	$I_O=0.1\text{mA}\sim I_{MAX}$ $1.4\text{V}\leq V_{OUT}\leq 3.9\text{V}$ $V_{IN}=5\sim 12\text{V}$		55	80	
	$4.0\text{V}\leq V_{OUT}\leq 5.2\text{V}$ $V_{IN}=7\sim 12\text{V}$		55	80	$\mu\text{A}$

Note 1: Guaranteed by design.

Note 2: Regulation is measured at constant junction temperature, using pulse testing with a low ON time.

Note 3: Current limit is measured by pulsing a short time.

Note 4: Dropout voltage is defined as the input to output differential at which the output voltage drops 100mV.

Note5: Specifications are guaranteed by Statistical Quality Controls (SQC), with no production test proved, when operating temperature ranges from  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ .

## ■ TYPICAL PERFORMANCE CHARACTERISTICS

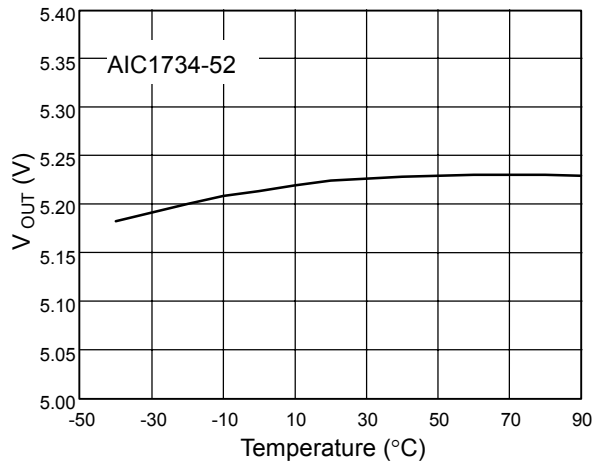


Fig. 1  $V_{OUT}$  vs. Temperature

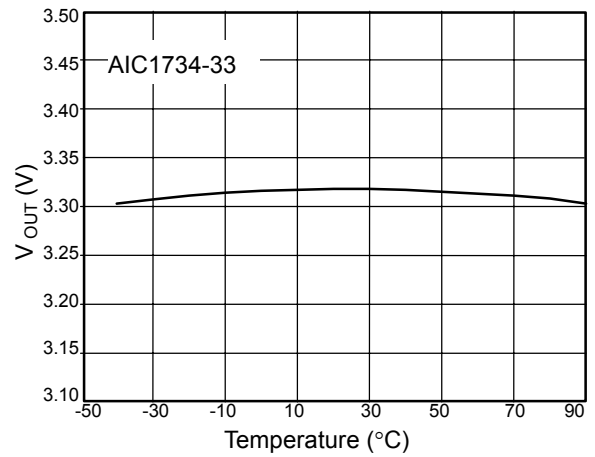


Fig. 2  $V_{OUT}$  vs. Temperature

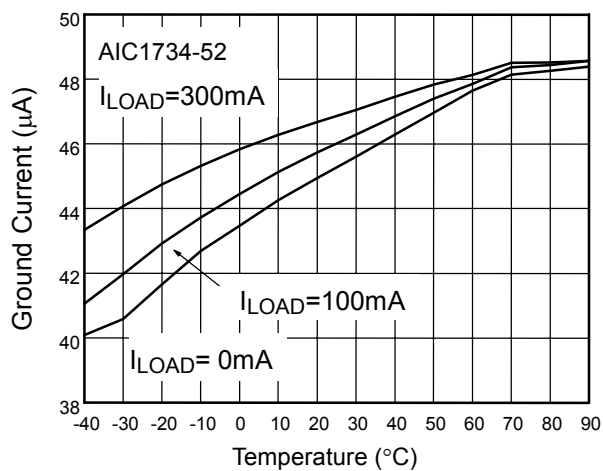


Fig. 3 Ground Current vs. Temperature

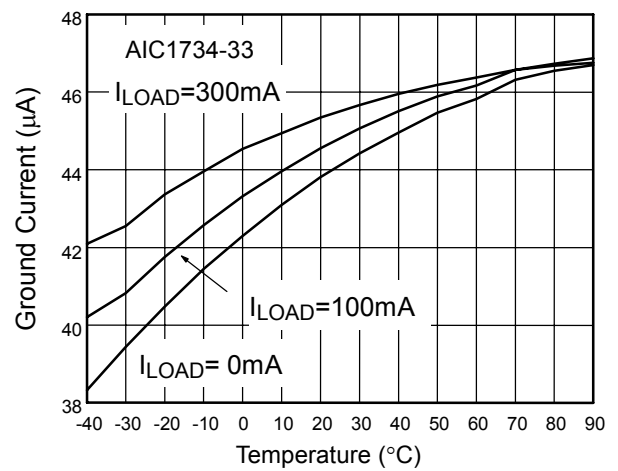


Fig. 4 Ground Current vs. Temperature

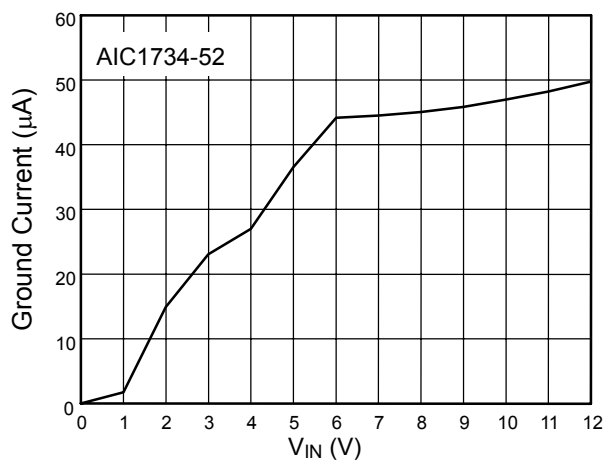


Fig. 5 Ground Current vs.  $V_{IN}$

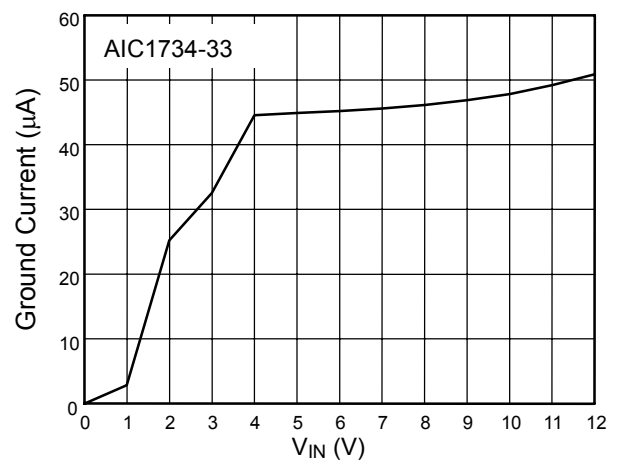


Fig. 6 Ground Current vs.  $V_{IN}$

## TYPICAL PERFORMANCE CHARACTERISTIC (Continued)

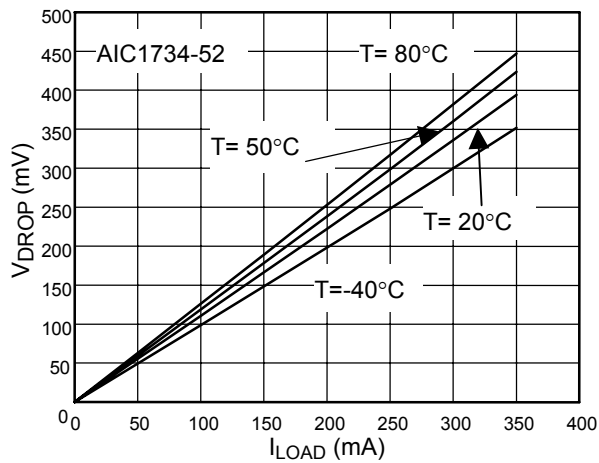


Fig. 7  $V_{DROP}$  vs.  $I_{LOAD}$

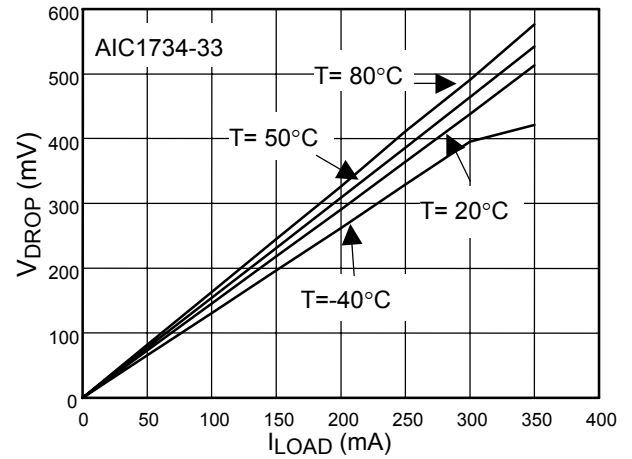


Fig. 8  $V_{DROP}$  vs.  $I_{LOAD}$

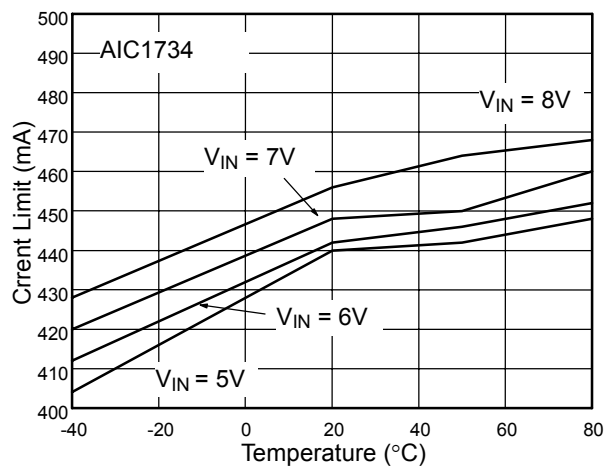
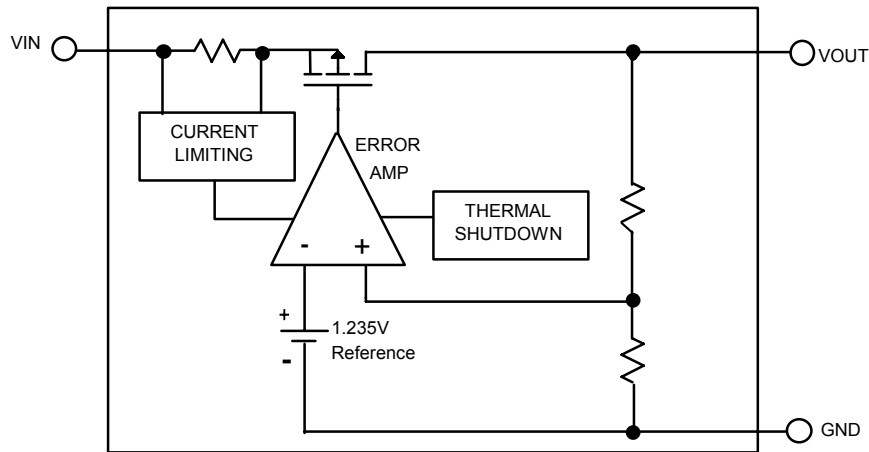


Fig. 9 Current Limit vs. Temperature

## ■ BLOCK DIAGRAM



## ■ PIN DESCRIPTIONS

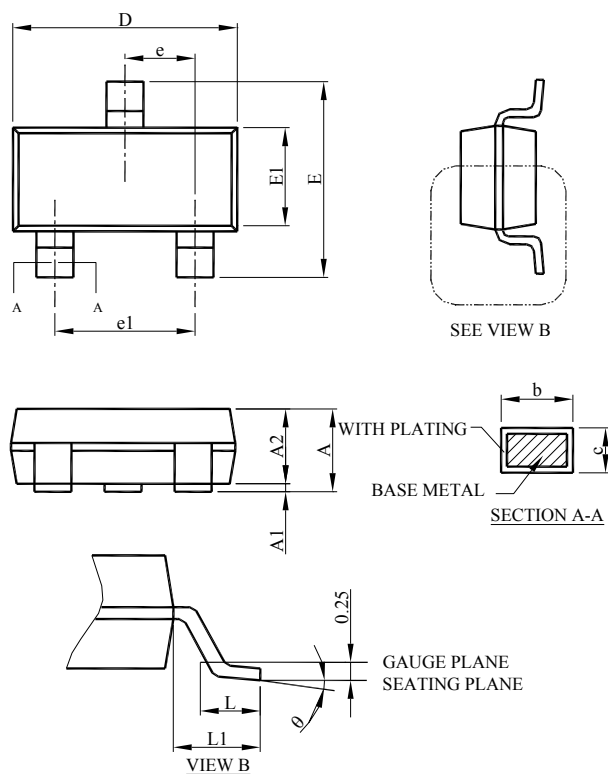
VOUT PIN - Output pin.

GND PIN - Power GND.

VIN PIN - Power Supply Input.

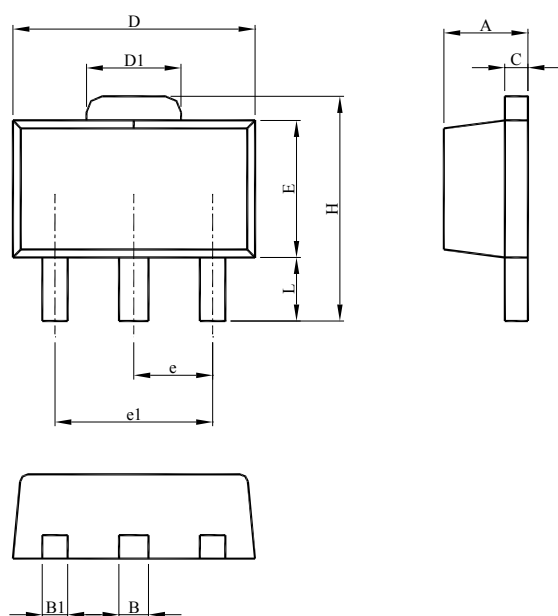
## ■ PHYSICAL DIMENSIONS (unit: mm)

### ● SOT-23



SYMBOL	SOT-23	
	MILLIMETERS	
	MIN.	MAX.
A	0.95	1.45
A1	0.05	0.15
A2	0.90	1.30
b	0.30	0.50
c	0.08	0.22
D	2.80	3.00
E	2.60	3.00
E1	1.50	1.70
e	0.95 BSC	
e1	1.90 BSC	
L	0.30	0.60
L1	0.60 REF	
θ	0°	8°

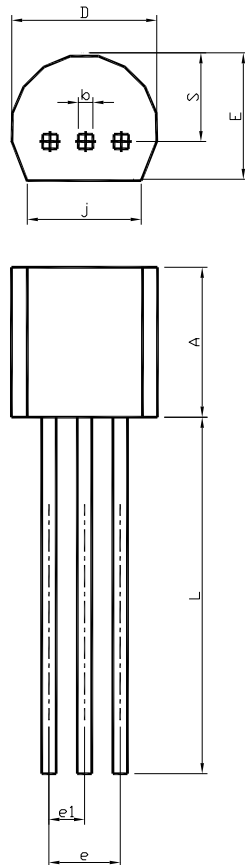
### ● SOT-89



SYMBOL	SOT-89	
	MILLIMETERS	
	MIN.	MAX.
A	1.40	1.60
B	0.44	0.56
B1	0.36	0.48
C	0.35	0.44
D	4.40	4.60
D1	1.50	1.83
E	2.29	2.60
e	1.50 BSC	
e1	3.00 BSC	
H	3.94	4.25
L	0.89	1.20



● TO-92



SYMBOL	TO-92	
	MILLIMETERS	
	MIN.	MAX.
A	4.32	5.33
b	0.36	0.47
D	4.45	5.20
E	3.18	4.19
e	2.42	2.66
e1	1.15	1.39
j	3.43	
L	12.70	
S	2.03	2.66

**Note:**

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